**Advanced Chemical Biology I, Fall 2018**

**Professors:**

戴桓青, Bruce Tai, hctai@ntu.edu.tw Department of Chemistry, NTU, Room 477, (02)3366-8682

陳韻如, Ruby Chen,  yrchen@gate.sinica.edu.tw , Genomics Research Center, Academia Sinica

何孟樵, Joseph Ho, joeho@gate.sinica.edu.tw , Institute of Biological Chemistry, Academia Sinica

**Teaching assistant:** 吳美伶 maylinwu@ntu.edu.tw (02) 33668668, Room A118

**Classroom**: Chemistry 121

**Hours**: Monday **13:30**-15:10, Thursday **13:30**-15:10

**Grading scheme:**

Midterm exam 50%, final exam 50%, Final presentation 20%

**Homework:**

Homework topic: Exciting new frontiers in chemical biology

Homework assignment: 5 min presentation, graded by other classmates

**Prerequisite:**

 Everyone enrolled in this class should have taken undergraduate level biochemistry. Some background information from basic biochemistry will be provided in the lectures. We will let undergraduate students enroll only if they have learned biochemistry before.

**Course language:**

 Lectures given in English

 Exam questions in English; Answer in Chinese or English

**Online material:**

 PowerPoint files and supplementary reading materials will be uploaded to CEIBA (ceiba.ntu.edu.tw) course website one day before the lecture

Tentative Course Syllabus (not final version, see CEIBA website for updates)

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| Date | Day | Topic | Note  |
| 9/10 | Mon | Introduction: what is chemical biology? |  |
| 9/13 | Thu | Nucleic acid structure |  |
| 9/17 | Mon | DNA sequencing and DNA mimetics |  |
| 9/20 | Thu | RNA and RNA interference |  |
| 9/24 | Mon | No class (Mid-Autumn Festival) |  |
| 9/27 | Thu | Ribozymes and aptamers |  |
| 10/1 | Mon | Protein and peptide synthesis |  |
| 10/4 | Thu | Protein transport and degradation |  |
| 10/8 | Mon | **Protein folding in equilibrium and kinetics** | **Ruby Chen** |
| 10/11 | Thu | **Protein folding in the cell** | **Ruby Chen** |
| 10/15 | Mon | **Protein misfolding and diseases** | **Ruby Chen** |
| 10/18 | Thu | Carbohydrates: structure |  |
| 10/22 | Mon | Carbohydrates: biosynthesis and function |  |
| 10/25 | Thu | Lipids and membranes |  |
| 10/29 | Mon | No class: KT Wang and Sunney Chen Lectures |  |
| 11/1 | Thu | No class: KT Wang and Sunney Chen Lectures |  |
| 11/5 | Mon | Lipid structure and function |  |
| 11/8 | Thu | No class (exam preparation) |  |
| 11/12 | Mon | Midterm Exam |  |
| 11/15 | Thu | No class (NTU Anniversary) |  |
| 11/19 | Mon | **Visualizing protein structure** | Joseph Ho |
| 11/22 | Thu | **NMR and cryo-EM** | Joseph Ho |
| 11/25 | Mon | **X-ray crystallography** | Joseph Jo |
| 11/29 | Thu | Antibody and biotin technology |  |
| 12/3 | Mon | Bioorthogonal Chemistry |  |
| 12/6 | Thu | Fluorescent dyes and proteins |  |
| 12/10 | Mon | Optical microscopy |  |
| 12/13 | Thu | Mass spec instrumentation |  |
| 12/17 | Mon | Protein sequencing by mass spec  |  |
| 12/20 | Thu | Protein quantification |   |
| 12/24 | Mon | Student presentation |  |
| 12/27 | Thu | Student presentation |  |
| 12/31 | Mon | No class (New Year holiday) | No class: New Year Holiday |
| 1/3 | Thu  | Student presentation | Homework Presentation |
| 1/7 | Mon | No class | No class  |
| 1/10 | Thu | Final exam  | Final exam |